

On three new armoured spiders (Araneae: Tetrablemmidae, Pacullinae) from Indonesia and Thailand

by

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With 27 figures

ABSTRACT

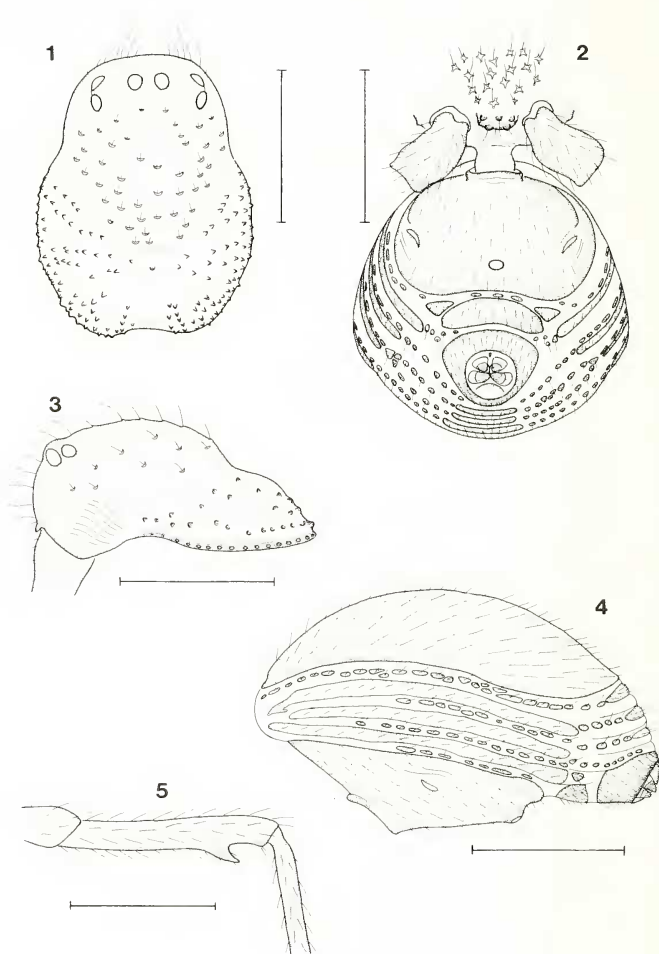
Lamania gracilis sp. n. (♂) from Bali, *Perania nasuta* sp. n. (♂, ♀) and *P. robusta* sp. n. (♂, ♀) from northern Thailand are described. The latter two species are sexually dimorphous with regard to clypeus and chelicerae. Internal genitalia of *Perania*, which closely resemble those of Pholcidae, are described for the first time. Web construction in *Perania* is noted. The validity of the monotypic genus *Mirania* Lehtinen is doubted, a new combination, *Perania armata* (Thorell) is proposed.

INTRODUCTION

Pacullinae is a small and little known subfamily of cryptic spiders, restricted in their distribution to southeast Asia. Together with the closely related Tetrablemminae, they occupy an outstanding position within the Sicarioidea (Scytodoidea sensu BRIGNOLI 1975) on account of the heavy sclerotization of the abdomen, a character that has developed convergently to the Oonopidae (SHEAR 1978). Specimens are occasionally obtained by sieving of leaf litter and extraction of soil cores, or they are collected in caves; so far, however, very little is known about their natural history.

Three new species are presented in this paper, one *Lamania* Simon from Bali, kindly placed at my disposal by Dr. Bernd Hauser, and two *Perania* Thorell, which I collected in Thailand. The latter species are particularly interesting, as this is the first record of new *Perania* since THORELL's descriptions of 1890 and 1898. *Perania korinchica* Hogg, 1920 was erroneously based on a single carapace of a female *P. picea* (Thorell) and an abdomen

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FIGS 1-5.

Lamania gracilis sp. n., male. Carapace, dorsal view (1), lateral view (3); abdomen, ventral view (2), lateral view (4); tibia of first leg (5). Scale 1.0 mm.

of *Leucauge emertoni* (Thorell) (SHEAR 1978, LEHTINEN 1981). In addition, a few observations on these spiders in their habitat may provide us with some basic knowledge of their biology.

ABBREVIATIONS: CTh Collection Thaler, Innsbruck; MCSNG Museo Civico di Storia Naturale, Genova; MHNG Muséum d'histoire naturelle, Genève; NHMW Naturhistorisches Museum, Wien; ALE, PME, PLE, anterior (posterior) median (lateral) eyes. Measurements are in mm.

DESCRIPTIONS OF SPECIES

Lamania gracilis sp. n.

Figs 1-5, 22, 23

Holotype ♂: Bali, Bedugul: forêt du Jardin botanique, 1230-1260 m, 30.XI.1987; C. Lienhard leg. (MHNG).

Etymology: *gracilis*, Latin: slender.

Diagnosis: *Lamania gracilis* sp. n. closely resembles *L. sheari* (Brignoli) but differs in the following: smaller in size; embolus pointed (figs 22, 23); tibia I with hooked proventral spur but not incrassate; metatarsus I smooth at ventral surface (fig. 5).

Male: Total length 3.7. Patella orange, other sclerotized parts of the body dark reddish brown, abdominal membranes light brown. Carapace 1.7 long, 1.4 wide; pars cephalica raised, covered with crescent-shaped hair pits; pars thoracica covered with wart-like tubercles, increasing in number along margins; fovea absent. Six oval eyes in three groups, PME 0.13 long, separated by 0.07; ALE and PLE 0.12 long, slightly raised and close to each other. Sternum 1.0 long, 0.9 wide, covered with star-like hair pits; posterior apophysis knob-shaped (fig. 2). Labium 0.4 long, 0.6 wide. Chelicerae with two short denticles between base of fang and median lamina. Legs 1243, long and slender; femur I sigmoid as seen from above; tibia I cylindrical and straight, distally with hooked ventral spur; metatarsus I smooth (fig. 5). Distal leg segments with pinnate setae; paired claws pectinate, unpaired claw with one tooth (see SHEAR 1978, fig. 112).

	I	II	III	IV	Palp
Femur	1.7	1.5	1.2	1.6	0.5
Patella	0.6	0.6	0.5	0.5	0.3
Tibia	1.4	1.1	0.9	1.4	0.4
Metatarsus	1.0	0.9	0.9	1.3	—
Tarsus	0.6	0.6	0.6	0.6	0.4

Total	5.3	4.7	4.1	5.4	1.6
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Abdomen 2.6 long, 1.8 wide, with characteristic pattern of sclerotization (figs 2, 4); dorsal scutum 2.3 long, 1.7 wide; pulmonary plate 1.7 long, 1.4 wide, bearing spiracles and genital pore; postgenital plate reduced to lateral patches; preanal plate 0.3 long, 0.7 wide; anal plate 0.5 long, 0.6 wide.

Bulb large and globular, with a ring of tiny denticles at the base of short subtriangular embolus (figs 22, 23).

Female: unknown.

Distribution: Known only from the type locality. Other members of the genus occur in peninsular Malaysia (one species), Borneo (three species) and Sulawesi (*L. sheari*).

***Perania nasuta* sp. n.**

Figs 6-9, 16-20, 24, 25

H o l o t y p e ♂ : Thailand, Chiang Mai Prov., Doi Inthanon, 1700 m, 8.X.1987; MHNG.

Paratypes: Doi Inthanon, 1700 m, 5♂: 18.II.1986, 18.IV. and 15.VII.1987, 15.I.1988, 5♀: 7.XI.1985, 18.IV., 20.VIII. and 8.X.1987; CTh, MCSNG, MHNG, NHMW.

2 juv.: Doi Inthanon, 2530 m, 4.IV.1987, Doi Suthep, 1180 m, 4.XI.-6.XII.1987; MHNG. All specimens P. Schwendinger leg.

Comparative material: *Perania birmanica* (Thorell), female holotype from Mount Carin Chebà, Bia-pò, Burma (1886-87, L. Fea leg.); MCSNG.E t y m o l o g y : *nasutus* 3, Latin: with a big nose — refers to the modification on the clypeus of males.D i a g n o s i s : *Perania nasuta* sp. n. closely resembles *P. birmanica* in the female. Vulva narrow, two subquadrangular spermathecae close to one another (fig. 17). Males with a long process on clypeus (figs 6, 8), 15-20 spicules on tibia and on metatarsus of leg I, embolus bifid (figs 24, 25).

M a l e : Total length, including clypeus process 8.8-10.5 (n=6). All sclerotized parts dark brown, membranes light brown. Carapace 4.9-5.7 long, one fourth occupied by the clypeus process, 2.3-2.6 wide; pars cephalica low, covered with wart-like tubercles bearing setae; pars thoracica densely covered with low, scale-like tubercles, towards the margins increasingly intermixed with warts bearing minute setae; shallow longitudinal fovea present (fig. 6). Six oval eyes in three groups; PME 0.26 long, separated by 0.17; ALE and PLE 0.24 long, slightly raised and closely spaced. Sternum 2.6 long, 1.8 wide, covered with wart-like hair pits; sternal apophysis with posterior lateral lobes. Labium 0.8 long, 1.1 wide. Chelicerae with 4-5 small denticles in a transverse row between base of fang and median lamina (fig. 16). Legs 1243, long and slender; femur I sigmoid; about 15-20 dark short spicules proventrally on metatarsus I and on distal half of tibia I. Distal leg segments with pinnate setae; paired claws pectinate, unpaired claw with one tooth.

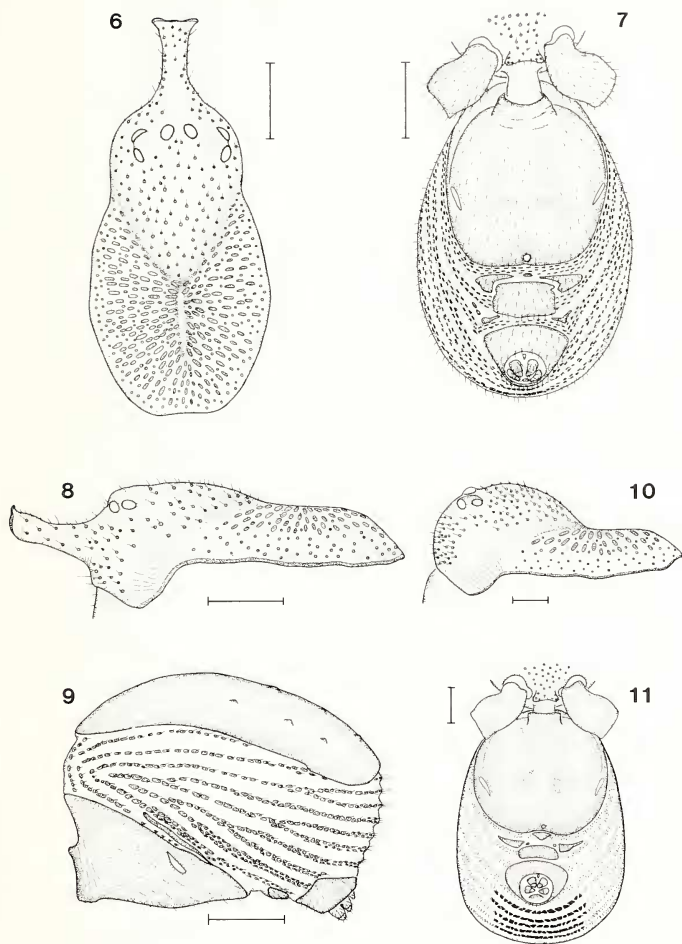
Leg measurements (holotype, carapace 5.7 long, 2.6 wide):

	I	II	III	IV	Palp
Femur	4.6	3.6	2.8	3.5	1.3
Patella	1.7	1.4	1.1	1.2	0.6
Tibia	4.5	3.4	2.3	3.2	1.2
Metatarsus	3.0	2.7	3.1	3.1	—
Tarsus	1.3	1.2	1.1	1.2	0.9
Total	15.1	12.3	10.4	12.2	4.0

Abdomen 5.0 long, 3.0 wide. Dorsal scutum subquadrangular, 4.5 long, 2.9 wide, uneven along the middle but otherwise smooth; branched lateral bands of small plates, each with a single seta (fig. 9); pulmonary plate 3.3 long, 2.4 wide, bearing spiracles and genital pore; postgenital plate reduced to lateral patches; preanal plate well developed, 0.5 long, 1.3 wide; anal plate 0.9 long, 1.3 wide (fig. 7).

Palpal tarsus pointed; bulb small and globular, bilobed embolus long and bent (figs 24, 25).

F e m a l e : As in the male, except for the following: Total length 7.6-9.0. Carapace 3.6-4.1 long, 2.3-2.6 wide, clypeus without modifications; pars cephalica



FIGS 6-11.

Perania nasuta sp. n., male (6-9) and *P. robusta* sp. n., male (10, 11). Carapace, dorsal view (6), lateral view (8, 10); abdomen, lateral view (9), ventral view (11). Scale 1.0 mm.

distinctly raised. PME 0.21-0.26 long, 0.17-0.23 apart; ALE 0.27 and PLE 0.23 long, raised on low mound. Sternum 2.5 long, 1.7 wide. Labium 0.8 long, 1.0 wide. Legs 1243; tibia and metatarsus I without spicules. Palpal tarsus without claws.

Leg measurements (carapace 4.1 long, 2.5 wide):

	I	II	III	IV	Palp
Femur	3.6	3.1	2.6	3.2	1.1
Patella	1.4	1.3	1.1	1.1	0.6
Tibia	3.3	2.8	2.1	2.8	0.8
Metatarsus	2.4	2.3	2.0	2.6	—
Tarsus	1.2	1.1	0.9	1.1	1.1
Total	11.9	10.6	8.7	10.8	3.6

Abdomen 8.1 long, 5.3 wide. Dorsal scutum 3.8 long, 2.3 wide; small cones scattered in between lateral plates along the posterior margin of the dorsal scutum (fig. 18); pulmonary plate 2.5 long, 2.2 wide, spiracles open onto small separate lateral plates; postgenital plate and preanal plate reduced; anal plate 0.9 long, 1.2 wide (fig. 19).

Vulva narrow, with hyaline posterior (pU) and thick, sclerotized anterior part (aU) of uterus externus. Ventrally two almost contiguous, wide spermathecae (S), broadly connected to the anterior uterus. They are subquadrangular, with small ventral poreplates and straight, heavily sclerotized lateral margins (fig. 17).

Juveniles show an incomplete pattern of sclerotization of the abdomen, being confined to petiolus, lung patches, spiracles and anal plate ventrally but entirely absent dorsally. In the juvenile male a clypeus process is indicated by a short pointed hump. See also LEHTINEN (1981: 23).

A f f i n i t i e s : Although females closely resemble *P. birmanica*, particularly in the surface sculpture of the carapace, differences are clearly recognizable. Apart from a lighter coloration (probably caused by exposure to light) the type of *P. birmanica* differs in having an arched anterior margin of the carapace, a suboval dorsal scutum with diffuse low tubercles and ridges over the entire, relatively wide (length: width = 1: 0.75) surface, and in continuous rows of small cones at the posterior margins of all lateral bands. In females of *P. nasuta* sp. n. the anterior carapace margin is straight, the dorsal scutum subquadrangular, with undulating margin and uneven surface only in a median line (fig. 18), length: width = 1: 0.54, 0.60, 0.63, 0.63, 0.71; cones are only scattered in between lateral plates, being confined to the posterior dorsal part of the abdomen. Rounded spermathecae shine through the pulmonary plate of *P. birmanica* (fig. 21), whereas in the lightest female of *P. nasuta* sp. n. straight lateral margins of receptacles are visible below the plate (fig. 20). For comparison see also BOURNE (1980, figs 20, 21, 23). Although not a distinguishing character, it should be mentioned that the PME of *P. birmanica* are separated by exactly their length (not by at least twice their diameter as indicated by BOURNE 1980). In all but one female of *P. nasuta* sp. n. the PME inter-distance is less than their length.

Considered together with a geographical separation of about 700 km, these characters seem sufficient to distinguish the two species.

D i s t r i b u t i o n : Known only from Doi Inthanon, 1700 and 2530 m, Chiang Mai Province, northern Thailand. A juvenile taken from Doi Suthep 1180 m, about 50 km from the type locality, probably also belongs to this species.

Natural history: *P. nasuta* sp. n. was found underneath overhanging ledges of road and path cuts, in primary evergreen hill forest. At night the spiders can be found hanging upside down in the center of an indistinct, loose sheetweb of about 500 cm². When disturbed, they retreat into a crevice connected with the web, where they rest during daytime. Two males, wandering at night, were collected in February, all others were taken from their webs. Mating probably takes place in the dry season (November to April), males seem to be long-lived. Phoretic deutonymphs of *Histiostoma longipes* Oudemans (Acari, Anoetidae) were clinging to some of the spiders.

***Perania robusta* sp. n.**

Figs 10-15, 26, 27

Holotype ♂: Thailand, Chiang Mai Prov., Doi Angkhang, 1450 m, 22.IV.1987; MHNG.

Paratypes: Doi Angkhang, 1450 m, 3♂, 1♀: 22.IV.1987, 1♂: 30.X.1987. CTh, MCSNG, MHNG, NHMW. All specimens P. Schwendinger leg.

Etymology: *robustus* 3, Latin: strong, stout.

Diagnosis: *Perania robusta* sp. n. is larger than all other known relatives. Males are distinguished by a lateral hump on the chelicerae (fig. 14), by the lack of a clypeus process, by about 10-15 spicules on tibia I, 5-6 on metatarsus I, and by a pointed embolus (figs 26, 27). Females have a wide vulva and distinctly separated suboval spermathecae (fig. 15).

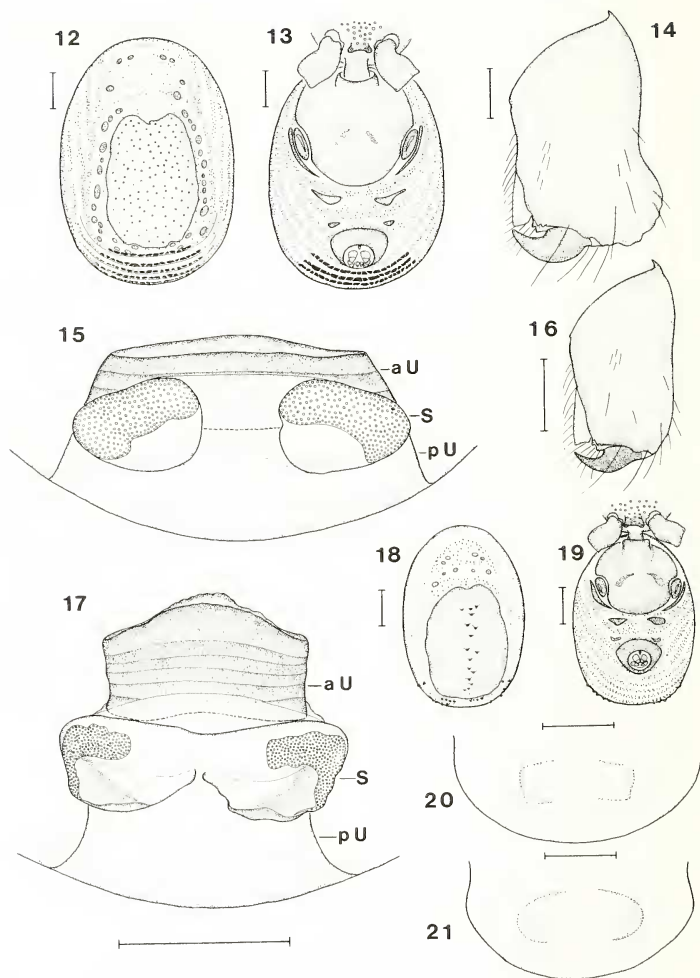
Male: Total length 12.1-13.1. All sclerotized parts very dark brown, membranes brown. Carapace 5.8-6.4 long, 3.7-4.1 wide, sculptured as in *P. nasuta* sp. n. Pars cephalica strongly elevated (fig. 10). PME 0.40 long, separated by 0.34; ALE 0.37 and PLE 0.38 long, raised on low mound. Sternum warty, 4.0 long, 2.4 wide; sternal apophysis with short lateral lobes. Labium 1.3 long, 1.6 wide. Chelicerae with 4-5 denticles between fang and median lamina, and with distinct retrolateral hump at distal corner (fig. 14). Legs 1243, long and slender. Femur I sigmoid, about 10-15 short spicules proventrally on distal tibia I and 5-6 slightly larger ones on metatarsus I. Distal leg segments with pinnate setae; paired claws pectinate, unpaired claw with one tooth.

Leg measurements (holotype, carapace 6.4 long, 4.1 wide):

	I	II	III	IV	Palp
Femur	7.6	5.7	4.5	5.3	1.8
Patella	2.7	2.1	1.6	1.8	0.8
Tibia	8.1	5.6	3.7	4.8	1.3
Metatarsus	4.8	4.3	3.6	4.6	—
Tarsus	1.9	1.8	1.4	1.5	1.8
Total	25.1	19.5	14.8	18.0	5.7

Abdomen 7.0 long, 4.7 wide. Dorsal scutum subquadrangular, 6.0 long, 4.2 wide; lateral plates large and almost interconnected at posterior margin of abdomen; pulmonary plate 4.5 long, 3.8 wide, bearing spiracles and genital pore; postgenital plate reduced; preanal plate 0.4 long, 1.3 wide; anal plate 1.3 long, 1.8 wide (fig. 11).

Palpal tarsus pointed; bulb small, embolus long, bent at base and distally pointed (figs 26, 27).



FIGS 12-21.

Perania robusta sp. n. (12-15), *P. nasuta* sp. n. (16-20) and *P. birmanica* (Thorell), holotype (21). Female abdomen, dorsal view (12, 18), ventral view (13, 19); male chelicera, posterior view (14, 16); vulva, ventral view (15, 17); genital area of female pulmonary plate (20, 21). S spermatheca, aU anterior, pU posterior uterus externus. Scale 1.0 mm (12, 13, 18, 19) and 0.5 mm (all others).

Female: As in the male, except for the following: Total length 12.0. Carapace 5.8 long, 3.7 wide. PME 0.36, separated by their length; ALE 0.31 and PLE 0.32. Sternum 3.5 long, 2.4 wide. Labium 1.2 long, 1.5 wide. Chelicerae robust but without hump. Legs 1243; leg I unmodified. Palpal tarsus without claw.

	I	II	III	IV	Palp
Femur	6.2	4.9	4.0	4.7	1.8
Patella	2.2	1.9	1.5	1.6	0.8
Tibia	5.8	4.6	3.1	4.1	1.2
Metatarsus	3.9	3.7	3.1	4.0	—
Tarsus	1.8	1.6	1.4	1.4	1.8
Total	19.9	16.7	13.1	15.8	5.6

Abdomen 6.9 long, 4.9 wide, laterally cream in anterior, light orange in posterior half. Dorsal scutum 3.9 long, 2.5 wide, with warty surface (fig. 12); pulmonary plate 3.4 long, 3.3 wide, spiracles on small lateral plates; postgenital and preanal plate reduced; anal plate 1.3 long, 1.7 wide (fig. 13).

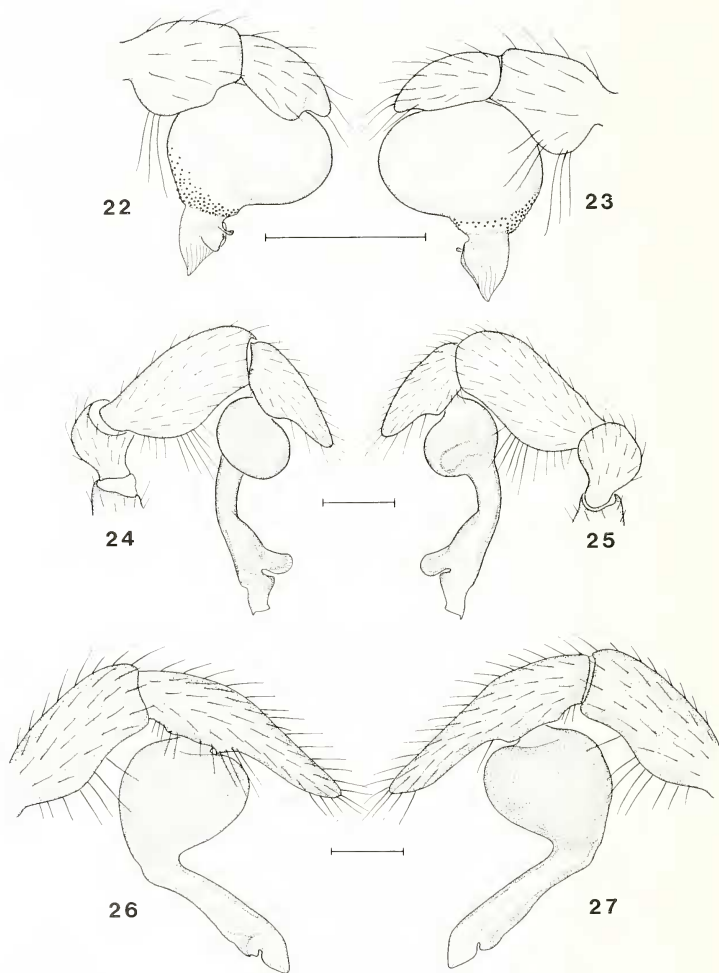
Vulva as in *P. nasuta* sp. n. but relatively wider and shorter, spermathecae (S) suboval and widely separated, ventral pore patches larger (fig. 15).

Distribution: Known only from Doi Angkhang, 1450 m, Chiang Mai Province, northern Thailand.

Natural history: The spiders were found in webs, larger than those of *P. nasuta* sp. n., underneath ledges of path cuts in a deforested area.

DISCUSSION

Lamania gracilis sp. n. can be clearly assigned to *Lamania* Lehtinen, whereas certain characters of *Perania nasuta* sp. n. and *P. robusta* sp. n. neither correspond with the current diagnosis of the genus and of the tribus Peraniini Lehtinen, nor with the separation of *Mirania* Lehtinen and *Perania* Thorell (LEHTINEN 1981). Spicules are present on the metatarsus I and additionally on the tibia I of males; paired depressions in the "epigynal area" of the pulmonary plate occur also in the male (figs 7, 11); distinct denticles are present between the fang and the median lamina of the chelicerae (figs 14, 16), which are sexually dimorphous in *P. robusta* sp. n. — *Perania* is said to have a relatively longer carapace than other genera of Pacullinae, which holds for both new species and others, but nevertheless the carapace of *Mirania armata* (Thorell) is relatively longer than that of *P. nigra* (Thorell). The cephalic region in the male of *P. nasuta* sp. n. is low in contrast to all other related species, possibly due to the development of a strong clypeus process. This pronounced carapace modification corresponds to the short horn on the clypeus of all known males of *Perania*, which is only lacking in *P. robusta* sp. n. Correspondingly congeneric species with and without paired processes in the thoracic region are present in *Lamania* and *Paculla* Simon. As also the postgenital and preanal plates are clearly recognizable in males of both new species, the taxonomic limits between *Mirania* (without clypeus horn but with thoracic processes) and *Perania* now appear uncertain. At the present state of knowledge it seems unreasonable to maintain *Mirania* as a monotypic genus. Therefore I suggest including *M. armata* in *Perania* on the basis of correspondence of male genital characters and the same reduced pattern of abdominal sclerites.



FIGS 22-27.

Lamania gracilis sp. n. (22, 23), *Perania nasuta* sp. n. (24, 25) and *P. robusta* sp. n. (26, 27). Male palp, prolateral view (22, 24, 26), retrolateral view (23, 25, 27). Scale 0.5 mm.

The distinct type of male palps in *Perania* was recognized by BOURNE (1980) and LEHTINEN (1981). A description of the internal genitalia of females can now be added to the generic characters: Uterus externus with thick, sclerotized anterior collar. Hyaline posterior atrium ventrally broadly connected with two hemispherical spermathecae bearing poreplates on their ventral surface. An inner vulval plate (sensu LEHTINEN 1981) is absent, the genital orifice is unpaired (figs 15, 17). The vulva of *Perania* differs from *Paculla* and *Sabayah* Deeleman-Reinhold by an unpaired genital orifice, from *Lamania* and *Paculla* by the lack of lateral membranous sacks, and from all three by a thick, sclerotized anterior uterus externus and the lack of an inner vulval plate (cf. SHEAR 1978, DEELEMEN-REINHOLD 1980, BOURNE 1981, LEHTINEN 1981). A similar type of haplogynous vulva is present in Pholcidae (cf. WIEHLE 1967), although the spermathecae are situated dorsally. This further supports the allocation of the Tetrablemmidae to the superfamily Sicarioidea.

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